

CLAIMS

What is claimed is:

1. A method of processing requests to access computing resources, comprising:
restricting processing of resource acquisition requests when a number of resources in use is within a first predetermined amount of a maximum number of available resources.
2. A method as recited in claim 1, wherein the resource acquisition requests include local resource acquisition requests generated by at least one local filesystem for access to local storage and network resource acquisition requests generated by at least one network filesystem for access to remote data via a network.
3. A method as recited in claim 2,
wherein the maximum number of available resources represents the available resources for the network resource acquisition requests and in addition, a local reserved number of the resources are available for the local resource acquisition requests, and
wherein said restricting applies an enforcement limit, smaller than the maximum number of available resources by the first predetermined amount, to the network resource acquisition requests.
4. A method as recited in claim 3,
wherein each network filesystem has a soft limit for executing the network resource acquisition requests, and
wherein said restricting further comprises holding a first network resource acquisition request in a first filesystem queue if execution of the first network resource acquisition request would cause the enforcement limit to be exceeded and the soft limit for a first network filesystem that generated the first network resource acquisition request has been exceeded.
5. A method as recited in claim 4, wherein said holding of the first resource acquisition request and any subsequently received resource acquisition requests for the first network filesystem is continued until at least one of: the executing resource acquisition requests for the

first network filesystem are below the soft limit, and the first resource acquisition request has been held on the first filesystem queue longer than a predetermined time period.

6. A method as recited in claim 5, wherein said method further comprises, upon completion of execution of each of the resource acquisition requests, initiating execution of a longest held resource acquisition request in a corresponding network filesystem queue if the corresponding network filesystem queue is not empty.

7. A method as recited in claim 6, further comprising flushing the network resource acquisition requests related to a new network resource acquisition request if the maximum number of available resources are in use when the new network resource acquisition request is received.

8. A method as recited in claim 7, further comprising holding the new network resource acquisition request and any subsequently received network resource acquisition requests in a global wait queue until the number of resources in use is less than the maximum number of available resources.

9. A method as recited in claim 8, further comprising repeating said flushing of the network resource acquisition requests, until the number of resources in use is less than the maximum number of available resources by at least the second predetermined amount.

10. A method as recited in claim 9, further comprising, upon completion of execution of each of the resource acquisition requests, releasing the new and any subsequently received network resource acquisition requests in the global wait queue, if the number of resources in use is less than the maximum number of available resources by at least the second predetermined amount.

11. A method as recited in claim 10, wherein said initiating execution of the longest held resource acquisition request in the corresponding network filesystem queue is not performed until the executing resource acquisition requests generated by a corresponding network filesystem are below the soft limit by a third predetermined amount.

12. A method as recited in claim 11, wherein the computing resources are handles providing access to data storage for the local and network filesystems.

13. A method as recited in claim 12, wherein at least one of the maximum number of available resources, the enforcement limit, the soft limit and the first, second and third predetermined amounts are configurable by a user.

14. At least one computer readable medium storing at least one program embodying a method of processing requests to access computing resources, said method comprising:
restricting processing of resource acquisition requests when a number of resources in use is within a first predetermined amount of a maximum number of available resources.

15. At least one computer readable medium as recited in claim 14, wherein the resource acquisition requests include local resource acquisition requests generated by at least one local filesystem for access to local storage and network resource acquisition requests generated by at least one network filesystem for access to remote data via a network.

16. At least one computer readable medium as recited in claim 15,
wherein the maximum number of available resources represents the available resources for the network resource acquisition requests and in addition, a local reserved number of the resources are available for the local resource acquisition requests, and
wherein said restricting applies an enforcement limit, smaller than the maximum number of available resources by the first predetermined amount, to the network resource acquisition requests.

17. At least one computer readable medium as recited in claim 16,
wherein each network filesystem has a soft limit for executing the network resource acquisition requests, and
wherein said restricting further comprises holding a first network resource acquisition request in a first filesystem queue if execution of the first network resource acquisition request would cause the enforcement limit to be exceeded and the soft limit for a

first network filesystem that generated the first network resource acquisition request has been exceeded.

18. At least one computer readable medium as recited in claim 17, wherein said holding of the first resource acquisition request and any subsequently received resource acquisition requests for the first network filesystem is continued until at least one of: the executing resource acquisition requests for the first network filesystem are below the soft limit, and the first resource acquisition request has been held on the first filesystem queue longer than a predetermined time period.

19. At least one computer readable medium as recited in claim 18, wherein said method further comprises, upon completion of execution of each of the resource acquisition requests, initiating execution of a longest held resource acquisition request in a corresponding network filesystem queue if the corresponding network filesystem queue is not empty.

20. At least one computer readable medium as recited in claim 19, further comprising flushing the network resource acquisition requests related to a new network resource acquisition request if the maximum number of available resources are in use when the new network resource acquisition request is received.

21. At least one computer readable medium as recited in claim 20, further comprising holding the new network resource acquisition request and any subsequently received network resource acquisition requests in a global wait queue until the number of resources in use is less than the maximum number of available resources.

22. At least one computer readable medium as recited in claim 21, further comprising, upon completion of execution of each of the resource acquisition requests, releasing the new and any subsequently received network resource acquisition requests in the global wait queue, if the number of resources in use is less than the maximum number of available resources by at least the second predetermined amount.

23. At least one computer readable medium as recited in claim 22, wherein at least one of the maximum number of available resources, the enforcement limit, the soft limit and the first and second predetermined amounts are configurable by a user.

24. A client node, having a limited number of resources, in a network of computer system nodes, comprising:

at least one local disk with local filesystems;

a communication link to obtain data accessed under control of another of the computer system nodes; and

at least one processor programmed to restrict processing of network resource acquisition requests generated by at least one network filesystem when a number of resources in use is within a first predetermined amount of a maximum number of available resources.